

Application No.: 09/828,607  
Reply and Amendment dated September 8, 2004  
In response to Final Office Action dated June 8, 2004

**REMARKS**

Claims 1-27, 30-34, 47, 48, 50 and 57-60 are pending in this application.

Applicants note that the June 8, 2004 Final Office Action indicates that claim 49 is currently pending. Applicants respectfully submit that claim 49 was canceled in applicants' March 23, 2004 Amendment and Reply to Office Action.

Applicants address the Examiner's rejection below:

**35 U.S.C. § 132**

The Examiner has objected to applicants' amendment filed April 22, 2004 under 35 U.S.C. § 132 stating that the amendment introduces new matter into the disclosure of the invention. Specifically, the Examiner asserts that there is no support in the original disclosure for the recitation of "inducing formation of functional permanent cartilage tissue", and in particular, the term "permanency." The Examiner also states that applicants did not provide support in the instant specification for this language but rather, presented statements

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that the amendment distinguishes the claimed invention from the art. Applicants traverse.

Applicants respectfully submit that applicants' Reply and Amendment Accompanying Request for Continued Examination filed on April 22, 2004 did in fact point to the support for the amendment (see Remarks section of 4/22/04 Reply on page 11). Notwithstanding, support for the amendment of inducing formation of functional permanent cartilage tissue is provided in the specification at, e.g., page 31, lines 26-28. Further support for this amendment is provided at specification page 24, lines 22-24. Accordingly, applicants request that the Examiner withdraw this objection.

**35 U.S.C. § 112, first paragraph**

The Examiner has rejected claims 1-27, 30-34, 47, 48, 50 and 57-60 under 35 U.S.C. § 112, first paragraph for lack of written description. Specifically, the Examiner contends that the claims recite added material which is not supported by the original disclosure. The Examiner states that the language "inducing the formation of functional permanent cartilage tissue"

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is not supported by the instant application and applicants have not pointed to any support in the instant application but instead, have presented statements that the amendment distinguishes the claimed invention from the art. Applicants traverse.

As discussed above, adequate support is provided in the specification for the amendment "inducing the formation of functional permanent cartilage tissue." In light of the identified support, applicants submit that the specification provides adequate written description for the claims. Accordingly, applicants request that the Examiner withdraw this rejection.

**35 U.S.C. § 103(a)**

Claims 1-25, 27, 30-34, 47-48, 57, and 59-60

The Examiner has maintained the rejection of claims 1-25, 27, 30-34, 47-48, 57, and 59-60 under 35 U.S.C. § 103(a) as being obvious over WO 96/14335 ("Luyten") in view of WO 95/16035 ("Celeste") and Cui et al., "Repair of thyroid cartilage defect with bone morphogenetic protein," Annals of Otology, Rhinology

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and Laryngology, 106, pp. 326-328 (1997) ("Cui"). The Examiner states that Luyten discloses CDMP-1 and CDMP-2 having *in vivo* chondrogenic activity and that the CDMPs may be combined with fibrin glue, cartilage grafts and collagens. The Examiner states that Celeste teaches BMPs are useful in the treatment of tendon or ligament defects and in the formation of bone, cartilage and tendon, as well as pharmaceutical acceptable carriers such as collagen, PLA, PGA and CMC. The Examiner further states that Cui teaches the repair of thyroid cartilage defect with BMPs. The Examiner, therefore, concludes that it would have been obvious to one skilled in the art to arrive at the claimed invention by combining the teachings of the cited references.

As discussed above, applicants maintain that in the specification provides adequate support for the amendment "permanent" and requests that the Examiner reconsider applicants' arguments with respect to 35 U.S.C. § 103 submitted April 22, 2004. Specifically, the claims of the instant application require that functional permanent replacement cartilage tissue be

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induced. This feature is not disclosed in Luyten, Celeste or Cui, either alone or in combination.

Luyten discloses that BMPs may have cartilage and bone inducing activity. However, the disclosure in Luyten relating to the cartilage inductive activity is in the context of the stages of endochondral bone formation. Specifically, Luyten states that the normal stages of endochondral bone formation "include mesenchymal condensation, cartilage, and bone marrow formation and eventual mineralization to produce mature bone" (see, page 1, lines 25-27). Therefore, in contrast with the amended claims of the instant application which require permanent cartilage formation, the cartilage formation disclosed in Luyten is a transient intermediate step in the process of endochondral bone formation.

Neither Cui nor Celeste remedies this deficiency. Cui discloses that bovine BMP repairs a thyroid cartilage defect by inducing new bone formation which fills the defect in the cartilage. Cui teaches that although both new bone and cartilage formation is observed four weeks following implantation of bBMP

at the cartilage defect, eight weeks after implantation, the bone formation had advanced to result in the complete closure of the defect (see, page 326, col. 2, to page 328, col. 1). Therefore, Cui confirms the teachings of Luyten that cartilage formation is temporary. In fact, the combination of Cui and Luyten teaches away from applicant's invention.

Celeste discloses that BMP-12 and BMP-13, either alone or in combination with other BMPs, induce tendon/ligament-like tissue healing and repair. Celeste discloses that BMP-12 implanted rats showed tendon/ligament-like tissue formation but no cartilage or bone formation, whereas BMP-2 implanted rats showed only the expected cartilage and bone formation. Nothing in Celeste teaches or suggests that the cartilage formation is permanent as is recited in the amended claims.

Accordingly, nothing in the combination of Luyten, Celeste or Cui, teaches a method for repairing nonarticular cartilage tissue or promoting chondrogenesis at a nonarticular defect locus by inducing functional permanent cartilage tissue, as recited in the amended claims of this application.

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Accordingly, applicants request that the Examiner withdraw this obviousness rejection.

Claims 1-6, 8-25, 27 and 30-34

The Examiner has maintained the rejection of claims 1-6, 8-25, 27 and 30-34 under 35 U.S.C. § 103(a) as being obvious over Cui in view of Celeste.

As discussed above, applicants request that the Examiner reconsider applicants' April 22, 2004 Reply to this 35 U.S.C. § 103(a) rejection in light of the support provided for the term "permanent" in the claims. The claims of the instant application require the replacement of functional permanent cartilage tissue. This feature is not disclosed or suggested by Celeste or Cui, either alone or in combination.

As discussed above, Cui discloses that bovine BMP induces new bone to fill the defect in the cartilage, not functional permanent cartilage as recited in the amended claims of the instant application. And, nothing in Celeste provides any teaching or suggestion that the recited osteogenic proteins

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claimed in the instant application are capable of inducing permanent replacement cartilage tissue.

Thus, nothing in the combination of Cui or Celeste, teaches or suggests a method for repairing a defect locus in a nonarticular cartilage tissue, thereby inducing the formation of functional permanent replacement cartilage tissue to repair the defect, using the specific osteogenic proteins recited in the amended claims. Accordingly, applicants request that the Examiner withdraw this obviousness rejection.

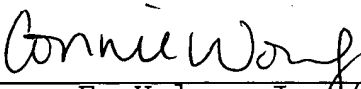


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**CONCLUSION**

In view of the foregoing remarks, applicants request that the Examiner favorably reconsider this application and allow the claims pending herein. If the Examiner believes that a telephone conference would expedite allowance of this application, she is invited to telephone the undersigned at any time.

Respectfully submitted,

  
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